

**KING COUNTY ENVIRONMENTAL LABORATORY
QUALITY ASSURANCE REVIEW**

for

ESTUARINE SEDIMENT ANALYTICAL DATA

**NORFOLK CSO SEDIMENT REMEDIATION PROJECT
FIVE-YEAR MONITORING PROGRAM
APRIL 2001 SAMPLING EVENT**

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INTRODUCTION

This quality assurance (QA) narrative is intended to document the QA review conducted on the chemistry analyses performed for the Norfolk CSO Sediment Remediation Study. The QA narrative is organized into the five sections listed below.

- General Comments
- Sample Collection
- Conventional Analyses
- Metal Chemistry
- Organic Chemistry

An overview of the approach used for the QA review is detailed in the *General Comments* section. Additional information specific to each analysis is included in the appropriate analytical section.

This QA review and narrative (specifically defined as QA1) have been conducted in accordance with guidelines established through the Puget Sound Dredged Disposal Analysis (PSDDA) program and the Sediment Management Standards (WAC 173-204-610). Other approaches incorporated in the QA review have been established through collaboration between the King County Environmental Laboratory (KC Laboratory) and the Washington State Department of Ecology (Ecology) Sediment Management Unit.

GENERAL COMMENTS

Scope of Samples Submitted

This QA review is associated with estuarine sediment samples collected in April 24, 2001 as part of the Norfolk CSO Sediment Remediation Study.

Except where noted in the subcontracting sections of this QA review, all analyses have been conducted by the King County Environmental Laboratory (KCEL). Sediment analytical data are reported with associated data qualifiers and have undergone QA1 review, as summarized in this narrative report.

Completeness

Completeness has been evaluated for this data submission and QA review by considering the following criteria:

- Comparing reported data to the planned project analyses summarized in Table 1.
- Compliance with storage conditions and holding times.
- Frequency of analysis of the complete set of quality control (QC) samples outlined in Table 2.

Subcontracted Analyses

Analyses that have been subcontracted and the issues associated with these subcontracted analyses are noted in this narrative.

Methods

Analytical methods are noted in the applicable analytical sections of this QA review.

Target Lists

The reported target lists have been compared to the target analytes listed in *Table 1 - Marine Sediment Quality Standards Chemical Criteria* and *Table 3 - Puget Sound Marine Sediment Cleanup Screening Levels Chemical Criteria* contained in Chapter 173-204 WAC.

Detection Limits

The KC Laboratory distinguishes between the reporting detection limit (RDL) and the method detection limit (MDL).

- The RDL is defined as *the minimum concentration of a chemical constituent that can be reliably quantified.*
- The MDL is defined as *the minimum concentration of a chemical constituent that can be detected.*

Some subcontracted laboratory data are available with an MDL only, in accordance with the subcontracting laboratory policies. All analytical parameters are reported with detection limit(s). For some methods the detection limits reported may vary from sample to sample depending on the amount of sample analyzed and any additional dilutions required.

Storage Conditions and Holding Times

Storage conditions and holding times have been evaluated using guidelines established during the Third Annual PSDDA Review Meeting. The approach used to evaluate Total Organic Carbon for holding time has been established between the KC Laboratory and Ecology during previous QA1 review efforts. Extraction and analysis holding times for each method are summarized in each analytical section.

Method Blanks

Method blank results have been used to evaluate the possible laboratory contamination of samples. Method blank results have been reviewed for the presence of analytes detected at or greater than the MDL.

Standard Reference Materials

Standard reference material (SRM) recoveries have been used to evaluate possible low or high analytical bias on a batch-specific basis. SRM analysis is included with metals and selected organic and conventional parameters (see Table 2). SRMs are purchased from the National Institute of Standards and Technology (NIST) or National Research Council of Canada (NRCC) and have certified analyte values. Lab Control Samples (or spiked blanks) may also be analyzed by the analytical laboratory as part of overall quality control but the results are not used to qualify the sample data.

Matrix Spikes

Matrix spike recoveries have been used to evaluate possible low or high analytical bias on a matrix and batch-specific basis. Matrix spikes are analyzed with metals, organics and selected conventional parameters (see Table 2).

Laboratory Replicate Samples

Replicate analysis (laboratory duplicates or triplicates) is used as an indicator of method precision and is used to qualify data on an analyte and batch-specific basis. Not all replicate data are used, however, as an indicator for data qualification. Only sets of replicate results which include at least one result greater than the RDL are considered for data qualification. These guidelines have been used to account for the fact that precision obtained near the detection limit is not representative of precision obtained throughout the entire analytical range.

Surrogates

Surrogate recoveries have been used to evaluate possible low or high analytical bias on a sample-specific basis. Surrogates are only analyzed for organic parameters.

Data Qualifiers

The data qualification system used for this data submission is presented in Table 3. These data qualifiers address situations that require qualification and generally conform to QA1 guidance. Changes made to SRM data qualification have been discussed with and approved by the Sediment Management Unit of Ecology. The qualifiers shown in Table 3 are also used for the Sedqual electronic data format (except for <MDL and <RDL).

Units and Significant Figures

Data have been reported in accordance with laboratory policy at the time of data generation. Data generally have been reported to three significant figures if above the RDL and two significant figures if equal to or below the RDL.

SAMPLE COLLECTION

This section describes sampling activities associated with the collection of 8 composite sediment samples on April 24, 2001. All sampling activities were conducted following guidance suggested in the Puget Sound Estuarine Protocols (PSEP, 1996 and 1998).

Sampling Locations and Station Positioning

Sampling locations (stations) were selected and the prescribed coordinates determined prior to field activities. Stations were selected to match the historical sampling locations for this on-going monitoring project. The prescribed station coordinates are presented in the following table. Also presented in the table are the actual coordinates recorded during sampling activities. All station coordinates are recorded in state plane coordinate system North American Datum 1983 (NAD83).

Lab ID #	Station Name	Prescribed Northing	Field Northing	Prescribed Easting	Field Easting
L20703-1, -2	NFK501	190170	190154	1278584	1278590
			190146		1278581
			190159		1278577
L20703-3, -4	NFK502	190159	190154	1278514	1278509
			190157		1278513
			190157		1278514
L20703-5, -6	NFK503	190195	190175	1278544	1278555
			190181		1278547
			190176		1278545
L20703-7, -8	NFK504	190080	190072	1278625	1278628
			190077		1278624
			190077		1278622

Sediment grab samples were collected from the King County research vessel *Chinook*, which is equipped with a differential global positioning system (DGPS). Field coordinates were recorded using DGPS for each acceptable deployment of the grab sampler as it contacted the sediment. Coordinates for each grab sampler deployment are included in the previous table.

The average coordinates for the sampler deployments are within 6 meters (19 feet) of the prescribed coordinates. Sampling at Stations NFK501 and NFK503 were slightly offset to the north due to low water levels.

Sample Description Table

Lab Sample #	Locator	Sample Collection	Sediment Depth used for Composite (from surface)	Sample Usage
L20703-1	NFK501	Surface Grabs	2 cm	Chemistry
L20703-2	NFK501	Surface Grabs	10 cm	Chemistry
L20703-3	NFK502	Surface Grabs	2 cm	Chemistry
L20703-4	NFK502	Surface Grabs	10 cm	Chemistry
L20703-5	NFK503	Surface Grabs	2 cm	Chemistry
L20703-6	NFK503	Surface Grabs	10 cm	Chemistry
L20703-7	NFK504	Surface Grabs	2 cm	Chemistry
L20703-8	NFK504	Surface Grabs	10 cm	Chemistry

Sample Collection and Handling

Eight composite samples in total were collected April 24, 2001 from the Norfolk Sediment Cap Monitoring Project site using a stainless steel, modified, 0.1 m² dual Van Veen grab sampler deployed from the *Chinook* via hydrowire. For each deployment, samples were collected from both the top 2 cm and top 10 cm of sediment, each from separate Van Veen samplers. Water depth at the four stations ranged between 1 to 2 meters (not corrected for tide). The depth of the grab deployments from the sediment surface ranged from 11 to 16 cm.

Samples were comprised of sediment aliquots collected from three individual grabs at each station with approximately an equal amount of material collected from each grab. The top 2cm samples were collected using a 200 cm² "cookie cutter" and stainless steel spatula. The 10cm samples were collected using a stainless steel spoon. Both 2cm and 10cm aliquots were taken from each Van Veen cast by sampling each fraction (2cm or 10cm) from a different side of the Van Veen sampler. Each of the aliquots were placed into a separate stainless-steel bowl, covered with foil between grab deployments. After collecting aliquots from three grabs, the sediment sample was thoroughly homogenized and sample aliquots split out into pre-labeled containers. Sample containers were supplied by the King County Environmental Laboratory and were pre-cleaned according to analytical specifications.

Individual sets of sample compositing equipment were dedicated to each station precluding the need for decontamination of the field gear. The Van Veen grab sampler was decontaminated between stations by scrubbing with a brush and ambient water followed by a thorough *in situ* rinsing.

Samples were stored in ice-filled coolers from the time of collection until delivery to the King County Environmental Laboratory. Samples were delivered under chain-of-custody and were maintained as such throughout the analytical process. Samples were stored frozen (-18°C) by the laboratory until analysis with the exception of samples for particle size distribution (PSD) analysis. PSD samples were stored refrigerated at approximately 4°C. A more complete description of sample handling and storage can be found in each analytical chemistry section of this narrative.

CONVENTIONAL ANALYSES

Completeness

Conventional data are reported for all samples and parameters summarized in Table 1. These samples were analyzed in association with the complete set of QC samples outlined in Table 2.

Subcontracted Analyses

Analysis for PSD was subcontracted to Rosa Environmental and Geotechnical Laboratory in Seattle, Washington.

Methods

PSD analysis was performed in accordance with ASTM and Puget Sound Protocols methodologies (*Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound* - page 9 - PSEP, 1986). TOC analysis was performed in accordance with SM5310-B. Total solids analysis were performed in accordance with SM2540-B.

Detection Limits, Units and Significant Figures

For analyses performed at the KC Laboratory, data are reported in accordance with laboratory policy at the time the data were generated. Data are reported to three significant figures for results greater than the RDL and two significant figures for results equal to or less than the RDL. For results reported with less than two or three significant figures, significant zeroes are implied. This may not apply to subcontracted data.

Storage Conditions and Holding Times

Sample storage conditions and holding times have been evaluated using guidelines established during the Third Annual PSDDA Review Meeting. The dates and holding time criteria for the actual storage conditions used for conventional analyses are listed in the table below.

Parameter	Lab ID#	Date Collected	Date Extracted	Date Analyzed	Sample Holding Time	Extract Holding Time
Particle Size Distribution	L20703-1,2,3,4,5,6,7,8	24-Apr-01	25-Apr-01	25-Apr-01	6 Months at 4°C	NA
Total Solids	L20703-1,2,3,4,5,6,7,8	24-Apr-01	NA	7-May-01	6 months at -18°C	NA
Total Organic Carbon	L20703-1,2,3,4,5,6,7,8	24-Apr-01	7-May-01*	25-May-01	6 months at -18°C	6 months at -18°C

* Preparation Date

Sample storage conditions and holding times were met for all samples in this data submission.

Method Blanks

Method blanks were analyzed in connection with solids and total organic carbon analyses. All method blanks results were less than the MDL.

Standard Reference Materials

An SRM (Buffalo River Sediment) was analyzed in connection with TOC analysis. The percent recovery for the SRM analysis was within the 80 to 120% QC limits.

Matrix Spikes

The selected analytical methods run on these samples do not require matrix spikes.

Laboratory Replicate Samples

Laboratory triplicate samples were analyzed for all conventional parameters. The percent relative standard deviations (%RSD) for all triplicate analyses were less than or equal to the 20% QC limit with the exception of PSD.

The %RSD for the gravel portion of the PSD measurement is greater than 20%. These categories represent less than 10% of the total particle distribution of the sample. Higher variability is expected for categories that represent 10% or less of the total mass. The results have been flagged with an "E" qualifier.

METALS CHEMISTRY

Completeness

Metal chemistry data are reported for all samples and parameters summarized in Table 1. These samples were analyzed for mercury and other metals in association with the complete set of QC samples outlined in Table 2.

Subcontracted Analyses

There were no subcontracted metals analyses for these samples.

Methods

Mercury analysis was performed in accordance with EPA Method 7471. Analysis for other metals was performed in accordance with EPA Methods 3050/6010.

Target List

The reported target list includes all metals specified in Table 1.

Detection Limits, Units and Significant Figures

For analyses performed at the KC Laboratory, data are reported in accordance with laboratory policy at the time the data were generated. Data are reported to three significant figures for results greater than the RDL and two significant figures for results equal to or less than the RDL. For results reported with less than two or three significant figures, significant zeroes are implied. This may not apply to subcontracted data.

Storage Conditions and Holding Times

Sample storage conditions and holding times have been evaluated using guidelines established during the Third Annual PSDDA Review Meeting. The dates and holding time criteria for the actual storage conditions used for metals analyses are listed in the table below.

Parameter	Lab ID#	Date Collected	Date Digested/Extracted	Date Analyzed	Sample Holding Time	Digestate/Extract Holding Time
Total Metals	L20703-1 to -8	4/24/01	5/15/01	5/21/01, 6/6/01	2 Years at -18°C	6 months
Total Mercury	L20703-1 to -8	4/24/01	5/14/01	5/15/01	28 days at -18°C	NA

Sample storage conditions and holding times were met for all samples in this data submission.

Method Blanks

All metals method blanks results were less than the MDL

Standard Reference Materials

The SRM analyzed in association with samples included in this data submission is Buffalo River Sediment. This SRM is not certified for Silver, Aluminum, Beryllium, Iron or Thallium. An SRM recovery less than the QC limit of 80% for ICP metals has not been used to qualify data because the digestion technique used for ICP analysis is different from the technique used during analysis to determine the SRM values. Only SRM recoveries greater than 120% will be used to qualify ICP data.

All total ICP metals SRM recoveries were less than the QC limit of 120%. All total mercury SRM recoveries were within the QC limits of 80-120%.

Matrix Spikes

The reported matrix spike recovery of 401% for aluminum is greater than the 125% upper QC limit. Aluminum results for all samples in this data submission have been qualified with the *L* flag. The reported matrix spike recovery of 65% for iron is less than the 75% lower QC limit. Iron results for all samples in this data submission have been qualified with the *G* flag. For the matrix spike, the background concentrations were significantly higher than the spike levels. Variability in the background levels may be responsible for the unacceptable recoveries rather than a true bias.

Laboratory Replicate Samples

The relative percent differences (RPDs) for laboratory duplicate results for all metals were less than or equal to the QC limit of 20%.

ORGANIC CHEMISTRY

Completeness

Organics data are reported for all samples and parameters summarized in Table 1. These samples were analyzed in association with the complete set of QC samples outlined in Table 2.

Methods

BNA analysis was performed in accordance with EPA method 8270. PCB analysis was performed in accordance with EPA methods 8082.

Target List

The reported BNA target list includes all compounds specified in *Table 1 - Marine Sediment Quality Standards Chemical Criteria* and *Table 3 - Puget Sound Marine Sediment Cleanup Screening Levels Chemical Criteria* contained in Chapter 173-204 WAC with the exception of benzo(j)fluoranthene. The KC Laboratory has verified that analytical conditions are sufficient to calculate a total benzofluoranthene result using the reported *b* and *k* isomers.

Reported PCB data include Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260.

Detection Limits, Units and Significant Figures

For analyses performed at the KC Laboratory, data are reported in accordance with laboratory policy at the time the data were generated. Data are reported to three significant figures for results greater than the RDL and two significant figures for results equal to or less than the RDL. For results reported with less than two or three significant figures, significant zeroes are implied.

Storage Conditions and Holding Times

Sample storage conditions and holding times have been evaluated using guidelines established during the Third Annual PSDDA Review Meeting. The dates and holding time criteria for the actual storage conditions used for conventional analyses are listed in the table below.

Parameter	Lab ID#	Date Collected	Date Extracted	Date Analyzed	Sample Holding Time	Extract Holding Time
BNAs	L20703-1 to -8	4/24/2001	5/10/01	6/5/01-6/7/01	1 year at -18°C	40 days at 4°C
PCBs	L20703-1 to -8	4/24/2001	5/9/01	6/7/01	1 year at -18°C	40 days at 4°C

Sample storage conditions and holding times were met for all samples in this data submission.

Method Blanks

1. BNAs

The method blank analyzed with BNAs for L20703 had results above the MDL for Bis(2-Ethylhexyl) Phthalate and Di-N-butyl Phthalate. Sample results for Bis(2-Ethylhexyl) Phthalate and Di-N- Butyl Phthalate for that batch (L20703) have been qualified with the B flag. All Bis(2-Ethylhexyl) Phthalate and Di-N-Butyl Phthalate results for these samples must be treated as estimated values.

All other method blank results (PCBs) were less than the MDL.

Surrogate Recoveries

1. BNA

BNA sample data are qualified when the average surrogate recovery for either or both the acid and base/neutral fractions are outside the 50 to 150% QC limits. The following table summarizes the average surrogate recoveries that are outside the QC limits and the appropriate flag. Only those average surrogate values that are outside the acceptance limit have been posted in the table. The first three samples in the list are the MS, MSD and SRM. Sample L20703-1 had no average surrogate value failures.

Lab ID#	Average Acid Surrogate Recovery	Flag Applied to Acid Compounds	Average B/N Surrogate Recovery	Flag Applied to B/N Compounds
L20703-2	43.5	G		
L20703-3	49.25	G		
L20703-5	44.5	G		
L20703-6	28	G	44.5	G
L20703-7	33.5	G	46.5	G
L20703-8	33.25	G	47.5	G

2. PCB

PCB sample data are qualified when both surrogate recoveries are outside QC limits. At least one PCB surrogate recovery was within the 50 to 150% QC limits for all samples in this data submission.

Standard Reference Materials

1. BNA

The sediment SRM analyzed in association with the reported BNA results is SRM 1944a, certified by the National Institute of Standards and Technology (NIST). Only a partial list of BNA parameters have certified values in SRM 1944a and therefore only those are used to qualify the data. Results for this partial list of compounds for the one batch of samples have been qualified based on the SRM recoveries outside the 80 to 120% QC limits. The recoveries and flags are summarized in the following table.

Compound	L20703-1 to 8	
	% Recovery	Flag
Naphthalene	13	G
Phenanthrene	84	
Anthracene	83	
Fluoranthene	111	
Pyrene	89	
Benzo(a)anthracene	99	
Chrysene	109	
Benzo(b)fluoranthene	100	
Benzo(k)fluoranthene	99	
Benzo(a)pyrene	109	
Indeno(1,2,3-c,d)pyrene	81	
Dibenzo(a,h)anthracene	110	
Benzo(g,h,i)perylene	66	G

2. PCB

The sediment SRM analyzed in association with the reported PCB results is HS-2, certified by the National Research Council of Canada. SRM HS-2 has a certified value for Aroclor 1254. The recovery of the certified parameters must be within 80 to 120% or the appropriate data are flagged. The SRM results for the batch of analyses is summarized below:

Compound	L20703-1 to 8	
	% Recovery	Flag
Aroclor 1254	100	

Matrix Spikes

1. BNA

The matrix spike recoveries for each BNA compound must be within the 50 to 150% QC limits. If not, all results for those particular compounds within the batch of samples must be flagged as follows. A G flag is applied if the recovery is between 10 and 50%, an X flag is applied if less than 10% recovery and an L flag is applied if greater than 150% recovery. The following table summarizes the matrix spike recoveries for specific compounds that are outside the QC limits and the appropriate flag.

Compound	L20703-1 to 8	
	% Recovery	Flag
N-Nitrodimethylamine	32	G
Phenol	27.2	G
Bis(2-Chloroethyl)Ether	26	G
2-Chlorophenol	28.3	G
1,3-Dichlorobenzene	23.6	G
1,4-Dichlorobenzene	23	G
1,2-Dichlorobenzene	24.3	G
Hexachloroethane	28	G
1,2,4-Trichlorobenzene	29.7	G
Naphthalene	32.3	G
Hexachlorobutadiene	29.9	G
Fluoranthene	165	L
Bis(2-Ethylhexyl)Phthalate	161	L
Aniline	0	X
Caffeine	155	L

2. PCB

The matrix spike recoveries for PCB compounds must be within the 50 to 150% QC limits. A G flag is applied if the recovery is between 10 and 50%, an X flag is applied if less than 10% recovery and an L flag is applied if greater than 150% recovery. Aroclor 1260 and 1016 only are used as the spiking compounds for PCB analysis.

All PCB matrix spike recoveries are within the QC limits.

Laboratory Replicate Samples

Lab Replicate (duplicate) samples for Organics have a target acceptance limit 100% for the Relative Percent Difference (RPD). All duplicate analyses showed acceptable RPD values except for the following:

1. BNAs

The RPDs for Phenanthrene, Fluoranthene, Pyrene, Chrysene, Benzo(b)Fluoranthrene, and Benzo(a)pyrene for the duplicate analysis of Sample L20703-6 were 200%. These parameters were detected just above the RDL in the lab duplicate but not in the original sample, resulting in an RPD of 200%. All results for these parameters have been flagged with an "E" for Samples L20703-1 through -8.

2. PCBs

No RPD limits were exceeded for the compounds reported.

TABLE 1
SEDIMENT SAMPLE INVENTORY

Sample	Locator / Description (see SAP)	PSD	Solids	TOC	Metals ¹	BNA ²	PCB	Comments
L20703-1	NFK501/Norfolk CSO channel, 0-2inches	X	X	X	X	X	X	
L20703-2	NFK501/Norfolk CSO channel, 0-10 inches	X	X	X	X	X	X	
L20703-3	NFK502/Delta of CSO channel, 0-2 inches	X	X	X	X	X	X	
L20703-4	NFK502/Delta of CSO channel, 0-10 inches	X	X	X	X	X	X	
L20703-5	NFK503/Boeing SD channel, 0-2 inches	X	X	X	X	X	X	
L20703-6	NFK503/Boeing SD channel, 0-10 inches	X	X	X	X	X	X	
L20703-7	NFK504/Upriver of CSO, 0-2 inches	X	X	X	X	X	X	
L20703-8	NFK504/Upriver of CSO, 0-10 inches	X	X	X	X	X	X	

¹ Metals = Hg, Al, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, Tl, Zn, Fe

² BNA = includes Chlorobenzenes

TABLE 2
QC SAMPLE FREQUENCY FOR SEDIMENT CHEMICAL AND PHYSICAL PARAMETERS

Parameter	Method Blank	Duplicate	Triplicate	Matrix Spike	SRM	Surrogates
PSD	No	10% of samples	10% of samples	No	No	No
Total Solids	1 per QC batch	5% minimum, 1 per QC batch	5% minimum, 1 per QC batch	No	No	No
TOC	1 per QC batch	5% minimum, 1 per QC batch	5% minimum, 1 per QC batch	No	1 per QC batch	No
Metals	1 per QC batch	5% minimum, 1 per QC batch	No	5% minimum, 1 per QC batch	1 per QC batch	No
BNA (w/ C1lorobenzenes)	1 per QC batch	5% minimum, 1 per QC batch	No	5% minimum, 1 per QC batch	1 per QC batch	Yes
PCB	1 per QC batch	5% minimum, 1 per QC batch	No	5% minimum, 1 per QC batch	1 per QC batch	Yes

TABLE 3 - SUMMARY OF SEDIMENT DATA QUALIFIERS

Condition to Qualify	Flag	Organic QC Limits	Metal QC Limits	Conventional QC Limits	Comment
very low matrix spike recovery	X	< 10 %	< 10 %	< 10 %	
low matrix spike recovery	G	< 50%	< 75%	< 75% *	
high matrix spike recovery	L	> 150%	>125%	>125% *	
low standard reference material recovery	G	< 80%	NA	< 80%	
high standard reference material recovery	L	>120%	>120%	>120%	
high duplicate relative percent difference	E	>100 %	>20%	NA	for organics and metals
high triplicate relative standard deviation	E	NA	NA	> 20 %	for conventionals
less than the reporting detection limit	<RDL **	NA	NA	NA	
less than the method detection limit	<MDL **	NA	NA	NA	
contamination reported in blank	B	>MDL	>MDL	>MDL	
biased data based on very low surrogate recoveries	X	all fraction surrogates <10%	NA	NA	average surrogate recovery for BNA
biased data based on low surrogate recoveries	G	all fraction surrogates <50%	NA	NA	average surrogate recovery for BNA
biased data based on high surrogate recoveries	L	all fraction surrogates >150%	NA	NA	average surrogate recovery for BNA
rejected - unusable for all purposes	R	NA	NA	NA	
a sample handling criteria has not been met	H	NA	NA	NA	container, hold time, preservation

65% to 135% for Total Sulfides.

** For Sedqual files, <MDL uses a "U" flag, <RDL is not flagged.

CONVENTIONAL ANALYSES QC DATA

CONVENTIONAL ANALYSES QC DATA

METRO Environmental Laboratory

WORK GROUP REPORT (wk02)

Jun 15 2001, 08:48 am

Work Group: WG55212 (norfolk TOC sed.) for Department: 3 - Conventionals

Created: 08-MAY-01 Due: Operator: gmw

Sample	Project Number	Project Description	PRy C Product	Matrix	Stat	UA	Workdate	Due date
L20703-1	423056-160	Norfolk Cleanup Study	SED S TOC	SALTWTRSED	DONE	U	22-MAY-01	08-JUN-01
L20703-2	423056-160	Norfolk Cleanup Study	SED S TOC	SALTWTRSED	DONE	U	22-MAY-01	08-JUN-01
L20703-3	423056-160	Norfolk Cleanup Study	SED S TOC	SALTWTRSED	DONE	U	22-MAY-01	08-JUN-01
L20703-4	423056-160	Norfolk Cleanup Study	SED S TOC	SALTWTRSED	DONE	U	22-MAY-01	08-JUN-01
L20703-5	423056-160	Norfolk Cleanup Study	SED S TOC	SALTWTRSED	DONE	U	22-MAY-01	08-JUN-01
L20703-6	423056-160	Norfolk Cleanup Study	SED S TOC	SALTWTRSED	DONE	U	22-MAY-01	08-JUN-01
L20703-7	423056-160	Norfolk Cleanup Study	SED S TOC	SALTWTRSED	DONE	U	22-MAY-01	08-JUN-01
L20703-8	423056-160	Norfolk Cleanup Study	SED S TOC	SALTWTRSED	DONE	U	22-MAY-01	08-JUN-01
WG55212-1	MB		S TOC	OTHR SOLID	DONE	U	25-MAY-01	
WG55212-2	SRM		S TOC	OTHR SOLID	DONE	U	25-MAY-01	
WG55212-3	LD		SED S TOC	SALTWTRSED	DONE	U	25-MAY-01	
WG55212-4	LT		SED S TOC	SALTWTRSED	DONE	U	25-MAY-01	

Comments:

L20703-1 3-Grab Composite, 0 - 2 cm
 L20703-2 3-Grab Composite, 0 - 10 cm
 L20703-3 3-Grab Composite, 0 - 2 cm
 L20703-4 3-Grab Composite, 0 - 10 cm
 L20703-5 3-Grab Composite, 0 - 2 cm
 L20703-6 3-Grab Composite, 0 - 10 cm
 L20703-7 3-Grab Composite, 0 - 2 cm
 L20703-8 3-Grab Composite, 0 - 10 cm
 WG55212-2 HICONC
 WG55212-3 L20703-1
 WG55212-4 WG55212-3 L20703-1

KING COUNTY METRO ENVIRONMENTAL LABORATORY

Lab QC Report - 06/15/01 08:50

Run ID: R66822 Workgroup: WG55212 (norfolk TOC sed.)

MB:WG55212-1 Matrix: OTHER SOLID Listtype: CVTOC Method: EPA9060-PSRP96 (03-04-002-001) Project: 423056-160 Pkey: SED

Parameter	Mdl	Rdl	Units	MB Value	Qual
Total Organic Carbon	500	1000	mg/Kg	<MDL	

SRM:WG55212-2 Matrix: OTHER SOLID Listtype: CVTOC Method: EPA9060-PSRP96 (03-04-002-001) Project: SED Pkey: SED

Parameter	Mdl	Rdl	Units	SampValue	Truevalue	SRM Value	% Rec. Qual	Limits	RPD/RSD	Qual	Limits
Total Organic Carbon	500	1000	mg/Kg		33480	32900	98	50-120			

ID:WG55212-3 LT:WG55212-4 L20703-1 Matrix: SALTYWTRSED Listtype: CVTOC Method: EPA9060-PSRP96 (03-04-002-001) Project: 423056-160 Pkey: SED

Parameter	Mdl	Rdl	Units	SampValue	Truevalue	ID Value	% Rec. Qual	Limits	Truevalue	LT Value	% Rec. Qual	Limits	RPD/RSD	Qual	Limits
Total Organic Carbon	500	1000	mg/Kg		5600	5850			5520				3		20

METRO Environmental Laboratory

WORK GROUP REPORT (wk02)

Jun 15 2001, 08:49 am

Work Group: WG55211 (norfolk TOTS) for Department: 3 - Conventionals

Created: 08-MAY-01 Due: Operator: gmw

Sample	Project Number	Project Description	PKY	C	Product	Matrix	Stat	UA	Workdate	Due date
L20703-1	423056-160	Norfolk Cleanup Study	SED	S	TOTS	SALTWTRSED	DONE	U	01-MAY-01	08-JUN-01
L20703-2	423056-160	Norfolk Cleanup Study	SED	S	TOTS	SALTWTRSED	DONE	U	01-MAY-01	08-JUN-01
L20703-3	423056-160	Norfolk Cleanup Study	SED	S	TOTS	SALTWTRSED	DONE	U	01-MAY-01	08-JUN-01
L20703-4	423056-160	Norfolk Cleanup Study	SED	S	TOTS	SALTWTRSED	DONE	U	01-MAY-01	08-JUN-01
L20703-5	423056-160	Norfolk Cleanup Study	SED	S	TOTS	SALTWTRSED	DONE	U	01-MAY-01	08-JUN-01
L20703-6	423056-160	Norfolk Cleanup Study	SED	S	TOTS	SALTWTRSED	DONE	U	01-MAY-01	08-JUN-01
L20703-7	423056-160	Norfolk Cleanup Study	SED	S	TOTS	SALTWTRSED	DONE	U	01-MAY-01	08-JUN-01
L20703-8	423056-160	Norfolk Cleanup Study	SED	S	TOTS	SALTWTRSED	DONE	U	01-MAY-01	08-JUN-01
WG55211-1	MR			S	TOTS	OTHR SOLID	DONE	U	08-MAY-01	
WG55211-2	LD		SED	S	TOTS	SALTWTRSED	DONE	U	08-MAY-01	
WG55211-3	LT		SED	S	TOTS	SALTWTRSED	DONE	U	08-MAY-01	

Comments:

L20703-1 3-Grab Composite, 0 - 2 cm
 L20703-2 3-Grab Composite, 0 - 10 cm
 L20703-3 3-Grab Composite, 0 - 2 cm
 L20703-4 3-Grab Composite, 0 - 10 cm
 L20703-5 3-Grab Composite, 0 - 2 cm
 L20703-6 3-Grab Composite, 0 - 10 cm
 L20703-7 3-Grab Composite, 0 - 2 cm
 L20703-8 3-Grab Composite, 0 - 10 cm
 WG55211-2 L20703-2
 WG55211-3 WG55211-2 L20703-2

MB:WG55211-1 Matrix: OTHER SOLID Listtype: CVTOTS Method: SM2540-G (03-01-007-001) Project: 423056-160 PKey: SED

Parameter	Well	Rdl	Units	MB Value	Qual
Total Solids	.005	.01	g	<MDL	

ID:WG55211-2 LT:WG55211-3 L20703-2 Matrix: SALTWATERSED Listtype: CVTOTS Method: SM2540-G (03-01-007-001) Project: 423056-160 PKey: SED

Parameter	Well	Rdl	Units	Sample Value	True Value	LT Value	% Rec. Qual	Limits	RPD/RSD Qual	Limits
Total Solids	.005	.01	g	65.4	65.4	65.4	65.4	0	20	20

METRO Environmental Laboratory

WORK GROUP REPORT (wk02)

Jun 15 2001, 08:49 am

Work Group: WG55197 (Norfolk PSD (ROSA)) for Department: 3 - Conventionals

Created: 07-MAY-01 Due: Operator: BP

Sample	Project Number	Project Description	PKey	C	Product	Matrix	Stat	UA	Workdate	Due date
L20703-1	423056-160	Norfolk Cleanup Study	SED	S	PSD	SALTWTRSED	DONE	U	08-JUN-01	08-JUN-01
L20703-2	423056-160	Norfolk Cleanup Study	SED	S	PSD	SALTWTRSED	DONE	U	08-JUN-01	08-JUN-01
L20703-3	423056-160	Norfolk Cleanup Study	SED	S	PSD	SALTWTRSED	DONE	U	08-JUN-01	08-JUN-01
L20703-4	423056-160	Norfolk Cleanup Study	SED	S	PSD	SALTWTRSED	DONE	U	08-JUN-01	08-JUN-01
L20703-5	423056-160	Norfolk Cleanup Study	SED	S	PSD	SALTWTRSED	DONE	U	08-JUN-01	08-JUN-01
L20703-6	423056-160	Norfolk Cleanup Study	SED	S	PSD	SALTWTRSED	DONE	U	08-JUN-01	08-JUN-01
L20703-7	423056-160	Norfolk Cleanup Study	SED	S	PSD	SALTWTRSED	DONE	U	08-JUN-01	08-JUN-01
L20703-8	423056-160	Norfolk Cleanup Study	SED	S	PSD	SALTWTRSED	DONE	U	08-JUN-01	08-JUN-01

Comments:

L20703-1	3-Grab Composite, 0 - 2 cm
L20703-2	3-Grab Composite, 0 - 10 cm
L20703-3	3-Grab Composite, 0 - 2 cm
L20703-4	3-Grab Composite, 0 - 10 cm
L20703-5	3-Grab Composite, 0 - 2 cm
L20703-6	3-Grab Composite, 0 - 10 cm
L20703-7	3-Grab Composite, 0 - 2 cm
L20703-8	3-Grab Composite, 0 - 10 cm

iD, LT performed on L20703-2

TS
6/15/01

QA SUMMARY

PROJECT: King County Environmental Lab		Project No.: 423056-160
REGL Triplicate Sample ID:	22822	Batch No.: 1011-022 -01
Client Triplicate Sample ID:	L20703-2	Page: 1 of 1

Relative Standard Deviation, By Component

Sample ID	Gravel	Sand	Silt	Clay
L20703-2 A	0.9	78.8	16.6	3.7
L20703-2 B	0.3	77.3	18.6	3.8
L20703-2 C	0.2	78.4	17.4	4.0
AVE	0.44	78.21	17.51	3.84
STDEV	0.40	0.77	0.99	0.17
%RSD	89.72	0.99	5.67	4.43

Notes to the Testing:

1. See narrative for discussion of testing.
2. The shaded box represents <10% of the sample. The QC sample does not need to be re-analyzed, since it is assumed higher variability, is due to the low level of this category in the sample rather than a systematic failure. Please refer to subcontract agreement Section 3.3.5.2 for the full explanation.

METAL CHEMISTRY QC DATA

KING COUNTY METRO ENVIRONMENTAL LABORATORY

Lab QC Report - 07/12/01 07:16

Run ID: R67265 Workgroup: WGS5349 (5/15/00 Norfolk Seds)

SB:WGS5349-1 Matrix: BLANK WTR Listtype: MTICP-SED Method: EPA3050A/6010B (06-02-004-002) Project: PKey: SED

Parameter	MDL	Rdl	Units	MB Value	Truevalue	SRM Value	% Rec.	Qual	Limits	Truevalue	Value	% Rec.	Qual	Limits	RPD/RSD	Qual	Limit
Silver, Total, ICP	.004	.02	mg/L	<MDL	1.2	1.12	93		85-115								
Aluminum, Total, ICP	.1	.5	mg/L	<MDL	12	11.2	93		85-115								
Arsenic, Total, ICP	.05	.25	mg/L	<MDL	4	3.72	93		85-115								
Beryllium, Total, ICP	.001	.005	mg/L	<MDL	0.4	.383	96		85-115								
Cadmium, Total, ICP	.003	.015	mg/L	<MDL	1.2	1.09	91		85-115								
Chromium, Total, ICP	.005	.025	mg/L	<MDL	1.2	1.14	95		85-115								
Copper, Total, ICP	.004	.02	mg/L	<MDL	1.2	1.15	94		85-115								
Iron, Total, ICP	.05	.25	mg/L	<MDL	50	45.2	90		85-115								
Manganese, Total, ICP	.002	.01	mg/L	<MDL	4	3.84	96		85-115								
Nickel, Total, ICP	.02	.1	mg/L	<MDL	1.2	1.11	92		85-115								
Lead, Total, ICP	.03	.15	mg/L	<MDL	4	3.71	93		85-115								
Selenium, Total, ICP	.05	.25	mg/L	<MDL	2	1.9	95		85-115								
Thallium, Total, ICP	.2	1	mg/L	<MDL	4	3.72	93		85-115								
Zinc, Total, ICP	.005	.025	mg/L	<MDL	4.5	4.5	100		85-115								

WB:WGS5349-2 Matrix: BLANK WTR Listtype: MTICP-SED Method: EPA3050A/6010B (06-02-004-002) Project: 423056-160 PKey: SED

Parameter	MDL	Rdl	Units	MB Value	Qual
Silver, Total, ICP	.004	.02	mg/L	<MDL	
Aluminum, Total, ICP	.1	.5	mg/L	<MDL	
Arsenic, Total, ICP	.05	.25	mg/L	<MDL	
Beryllium, Total, ICP	.001	.005	mg/L	<MDL	
Cadmium, Total, ICP	.003	.015	mg/L	<MDL	
Chromium, Total, ICP	.005	.025	mg/L	<MDL	
Copper, Total, ICP	.004	.02	mg/L	<MDL	
Iron, Total, ICP	.05	.25	mg/L	<MDL	
Manganese, Total, ICP	.002	.01	mg/L	<MDL	
Nickel, Total, ICP	.02	.1	mg/L	<MDL	
Lead, Total, ICP	.03	.15	mg/L	<MDL	
Selenium, Total, ICP	.05	.25	mg/L	<MDL	
Thallium, Total, ICP	.2	1	mg/L	<MDL	
Zinc, Total, ICP	.005	.025	mg/L	<MDL	

SRM:WGS5349-3 Matrix: SALTWTRSED Listtype: MTICP-SED Method: EPA3050A/6010B (06-02-004-002) Project: PKey: SED

Parameter	MDL	Rdl	Units	Sample Value	Truevalue	SRM Value	% Rec.	Qual	Limits
Arsenic, Total, ICP	.12	59.5	mg/Kg		211	162	77		120
Cadmium, Total, ICP	.71	3.57	mg/Kg		2.38	1.9	79		120
Chromium, Total, ICP	1.2	5.95	mg/Kg		113	56.1	50		120
Copper, Total, ICP	.95	4.76	mg/Kg		452	402	89		120
Manganese, Total, ICP	.48	2.38	mg/Kg		470	273	58		120
Nickel, Total, ICP	4.8	23.8	mg/Kg		44.1	31.3	71		120
Lead, Total, ICP	7.1	35.7	mg/Kg		484	362	90		120
Selenium, Total, ICP	12	59.5	mg/Kg		1.09	<MDL	0		120
Zinc, Total, ICP	1.2	5.95	mg/Kg		824	734	89		120

Note: True values
1PSS
in DL
3/5/01

LCS CBE 9/5/01

Parameter	MDL	Rdl	Units	Sample Value	True Value	SRM Value	Rec. Qual	Limits	RP/RSD	Qual	Limit
Silver, Total, ICP	.99	4.94	mg/Kg	107	110	102		120			
Aluminum, Total, ICP	25	124	mg/Kg	4806	4740	99		120			
Arsenic, Total, ICP	12	61.8	mg/Kg	53.2	52	99		120			
Beryllium, Total, ICP	.25	1.24	mg/Kg	68.3	69.1	101		120			
Cadmium, Total, ICP	.74	3.71	mg/Kg	151	158	105		120			
Chromium, Total, ICP	1.2	6.18	mg/Kg	99.4	97	98		120			
Copper, Total, ICP	.99	4.94	mg/Kg	59.2	59.5	101		120			
Iron, Total, ICP	12	61.8	mg/Kg	9880	11000	111		120			
Manganese, Total, ICP	.49	2.47	mg/Kg	218	228	105		120			
Nickel, Total, ICP	4.9	24.7	mg/Kg	63.3	62.8	99		120			
Lead, Total, ICP	7.4	37.1	mg/Kg	97.8	110	112		120			
Selenium, Total, ICP	12	61.8	mg/Kg	143	143	100		120			
Thallium, Total, ICP	49	247	mg/Kg	103	110	103		120			
Zinc, Total, ICP	1.2	6.18	mg/Kg	123	122	99		120			

Parameter	MDL	Rdl	Units	Sample Value	True Value	ED Value	Rec. Qual	Limits	RP/RSD	Qual	Limit
Silver, Total, ICP	.2	.99	mg/Kg	<MDL	<MDL			20			
Aluminum, Total, ICP	4.9	24.7	mg/Kg	7510	7280			20			
Arsenic, Total, ICP	2.5	12.4	mg/Kg	<MDL	<MDL			20			
Beryllium, Total, ICP	.049	.247	mg/Kg	.2	.19			20			
Cadmium, Total, ICP	.15	.742	mg/Kg	<MDL	<MDL			20			
Chromium, Total, ICP	.25	1.24	mg/Kg	11.1	11.2			20			
Copper, Total, ICP	.2	.99	mg/Kg	13.1	12.8			20			
Iron, Total, ICP	2.5	12.4	mg/Kg	13600	13300			20			
Manganese, Total, ICP	.039	.495	mg/Kg	226	222			20			
Nickel, Total, ICP	.99	4.95	mg/Kg	9.28	9.4			20			
Lead, Total, ICP	1.5	7.42	mg/Kg	9.51	8.45			20			
Selenium, Total, ICP	2.5	12.4	mg/Kg	<MDL	<MDL			20			
Thallium, Total, ICP	9.9	49.5	mg/Kg	<MDL	<MDL			20			
Zinc, Total, ICP	.25	1.24	mg/Kg	36	36.2			20			

Parameter	MDL	Rdl	Units	Sample Value	True Value	MS Value	Rec. Qual	Limits	RP/RSD	Qual	Limit
Silver, Total, ICP	.2	1.02	mg/Kg	<MDL	1.2	55.6	91	75-125			
Aluminum, Total, ICP	5.1	25.5	mg/Kg	7510	12	9950	401	75-125			
Arsenic, Total, ICP	2.5	12.7	mg/Kg	<MDL	4	185	91	75-125			
Beryllium, Total, ICP	.051	.255	mg/Kg	.2	.4	18.9	92	75-125			
Cadmium, Total, ICP	.15	.764	mg/Kg	<MDL	1.2	54.6	89	75-125			
Chromium, Total, ICP	.25	1.27	mg/Kg	11.1	1.2	66.6	91	75-125			
Copper, Total, ICP	.2	1.02	mg/Kg	13.1	1.2	69.5	92	75-125			
Iron, Total, ICP	2.5	12.7	mg/Kg	13600	50	15200	65	75-125			
Manganese, Total, ICP	.1	.509	mg/Kg	226	4	414	92	75-125			
Nickel, Total, ICP	1	5.09	mg/Kg	9.28	1.2	63	88	75-125			

MS:WGS5349-6 L20703-7 Matrix: SALTWTRSED Listtype: MTICP-SED Method: EPA3050A/6010B (06-02-004-002) Project: 423056-160 PKey: SED

Parameter	MDL	Rdl	Units	SampValue	Truevalue	MS Value	Rec. Qual	Limits	RPD/RSD	Qual	Limit
Lead, Total, ICP	1.5	7.64	mg/Kg	9.51	4	191	89	75-125			
Selenium, Total, ICP	2.5	12.7	mg/Kg	<MDL	2	93.4	92	75-125			
Thallium, Total, ICP	10	50.9	mg/Kg	<MDL	4	183	90	75-125			
Zinc, Total, ICP	25	1.27	mg/Kg	36	4.5	266	108	75-125			

SDIL:WGS5349-7 Matrix: SALTWTRSED Listtype: MTICP-SED Method: EPA3050A/6010B (06-02-004-002) Project: 423056-160 PKey: SED

Parameter	MDL	Rdl	Units	SampValue	Truevalue	SDIL Value	Rec. Qual	Limits	RPD/RSD	Qual	Limit
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KING COUNTY METRO ENVIRONMENTAL LABORATORY

Lab QC Report - 05/16/01 08:50

Run ID: R66294 Workgroup: W55347 (5/15/01 Fort Dent Water Reuse)

MB:W55347-1 Matrix: BLANK WTR Listtype: MTHG-SED Method: EPA 245.5 (06-01-004-003) Project: 423258-10 PKey: STD

Parameter Mercury, Total, CVAA Mdl .0002 Rdl .002 Units mg/L MB Value Qual <MDL

SB:W55347-2 Matrix: BLANK WTR Listtype: MTHG-SED Method: EPA 245.5 (06-01-004-003) Project: HKey: STD

Parameter Mercury, Total, CVAA Mdl .0002 Rdl .002 Units mg/L MB Value Truevalue SB Value & Rec. Qual Limits Truevalue Value & Rec. Qual Limits RPD/RSD Qual Limit

SRM:W55347-3 Matrix: SOIL Listtype: MTHG-SED Method: EPA 245.5 (06-01-004-003) Project: HKey: STD

Parameter Mercury, Total, CVAA Mdl .094 Rdl .943 Units mg/Kg SampValue Truevalue SRM Value & Rec. Qual Limits

LD:W55347-4 L20771-12 Matrix: SOIL Listtype: MTHG-SED Method: EPA 245.5 (06-01-004-003) Project: 423258-10 PKey: STD

Parameter Mercury, Total, CVAA Mdl .02 Rdl .198 Units mg/Kg SampValue Truevalue LD Value & Rec. Qual Limits

MS:W55347-5 L20771-12 Matrix: SOIL Listtype: MTHG-SED Method: EPA 245.5 (06-01-004-003) Project: 423258-10 PKey: STD

Parameter Mercury, Total, CVAA Mdl .02 Rdl .198 Units mg/Kg SampValue Truevalue MS Value & Rec. Qual Limits

ORGANIC CHEMISTRY QC DATA

METRO Environmental Laboratory

WORK GROUP REPORT (wk02)

May 15 2001, 10:33 am

Work Group: WG55264 (BS#110-bnall) for Department: 7 - Organics, Trace

Created: 10-MAY-01 Due: Operator: lm/mm

Sample	Project Number	Project Description	PKey	C Product	Matrix	Stat	UA	Workdate	Due date
L20703-1	423056-160	Norfolk Cleanup Study	SED	S BNALL	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-2	423056-160	Norfolk Cleanup Study	SED	S BNALL	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-3	423056-160	Norfolk Cleanup Study	SED	S BNALL	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-4	423056-160	Norfolk Cleanup Study	SED	S BNALL	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-5	423056-160	Norfolk Cleanup Study	SED	S BNALL	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-6	423056-160	Norfolk Cleanup Study	SED	S BNALL	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-7	423056-160	Norfolk Cleanup Study	SED	S BNALL	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-8	423056-160	Norfolk Cleanup Study	SED	S BNALL	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
WG55264-1	MB			S BNALL	OTHR SOLID	PREP	U	10-MAY-01	
WG55264-2	SB			S BNALL	OTHR SOLID	PREP	U	10-MAY-01	
WG55264-3	MS		SED	S BNALL	SALTWTRSED	PREP	U	10-MAY-01	
WG55264-4	MSD		SED	S BNALL	SALTWTRSED	PREP	U	10-MAY-01	
WG55264-5	LD		SED	S BNALL	SALTWTRSED	PREP	U	10-MAY-01	
WG55264-6	SRM			S BNALL	OTHR SOLID	PREP	U	10-MAY-01	

Comments:

L20703-1	3-Grab Composite, 0 - 2 cm
L20703-2	3-Grab Composite, 0 - 10 cm
L20703-3	3-Grab Composite, 0 - 2 cm
L20703-4	3-Grab Composite, 0 - 10 cm
L20703-5	3-Grab Composite, 0 - 2 cm
L20703-6	3-Grab Composite, 0 - 10 cm
L20703-7	3-Grab Composite, 0 - 2 cm
L20703-8	3-Grab Composite, 0 - 10 cm
WG55264-1	MB051001
WG55264-2	WG55264-1
WG55264-3	L20703-5
WG55264-4	WG55264-3 L20703-5
WG55264-5	L20703-6
WG55264-6	1944

7-3-01

KING COUNTY METRO ENVIRONMENTAL LABORATORY
Lab QC Report - 06/29/01 09:39
Run ID: R68341 Workgroup: W655264 (BS#110-bnall)

MB:W655264-1 Matrix: OTHR SOLID Listtype: ORBNALL Method: EPA 35508/8270C (7-3-01-004) Project: PKey: SED

Parameter	Mdl	Rdt	Units	MB Value	Qual
N-Nitrosodimethylamine	20	40	ug/Kg	<MDL	
Phenol	9	18	ug/Kg	<MDL	
Bis(2-Chloroethyl)Ether	15	30	ug/Kg	<MDL	
2-Chlorophenol	8	16	ug/Kg	<MDL	
1,3-Dichlorobenzene	.26	.53	ug/Kg	<MDL	
1,4-Dichlorobenzene	.13	.264	ug/Kg	<MDL	
1,2-Dichlorobenzene	.26	.53	ug/Kg	<MDL	
Bis(2-Chloroisopropyl)Ether	15	30	ug/Kg	<MDL	
N-Nitrosodi-N-Propylamine	9	18	ug/Kg	<MDL	
Hexachloroethane	15	30	ug/Kg	<MDL	
Nitrobenzene	16	32	ug/Kg	<MDL	
Isophorone	19	38	ug/Kg	<MDL	
2-Nitrophenol	15	30	ug/Kg	<MDL	
2,4-Dimethylphenol	7	14	ug/Kg	<MDL	
Bis(2-Chloroethoxy)ethane	17	34	ug/Kg	<MDL	
2,4-Dichlorophenol	16	32	ug/Kg	<MDL	
1,2,4-Trichlorobenzene	.26	.53	ug/Kg	<MDL	
Naphthalene	14	28	ug/Kg	<MDL	
Hexachlorobutadiene	.75	1.5	ug/Kg	<MDL	
2,4,6-Trichlorophenol	13	26	ug/Kg	<MDL	
2-Chloronaphthalene	16	32	ug/Kg	<MDL	
Acenaphthylene	15	30	ug/Kg	<MDL	
Dimethyl Phthalate	11	22	ug/Kg	<MDL	
2,6-Dinitrotoluene	10	20	ug/Kg	<MDL	
Acenaphthene	7	14	ug/Kg	<MDL	
2,4-Dinitrotoluene	3	6	ug/Kg	<MDL	
Fluorene	13	26	ug/Kg	<MDL	
Diethyl Phthalate	6	12	ug/Kg	<MDL	
4-Chlorophenyl Phenyl Ether	13	26	ug/Kg	<MDL	
N-Nitrosodiphenylamine	20	40	ug/Kg	<MDL	
1,2-Diphenylhydrazine	10	20	ug/Kg	<MDL	
4-Bromophenyl Phenyl Ether	9	18	ug/Kg	<MDL	
Hexachlorobenzene	.66	1.33	ug/Kg	<MDL	
Pentachlorophenol	5	10	ug/Kg	<MDL	
Phenanthrene	4	8	ug/Kg	<MDL	
Anthracene	4	8	ug/Kg	<MDL	
Di-N-Butyl Phthalate	5	10	ug/Kg	<MDL	
Fluoranthene	8	16	ug/Kg	<MDL	
Pyrene	4	8	ug/Kg	<MDL	
Benzyl Butyl Phthalate	6	12	ug/Kg	<MDL	
Benzo(a)anthracene	2	4	ug/Kg	<MDL	
Chrysene	4	8	ug/Kg	<MDL	
Bis(2-Ethylhexyl)Phthalate	6.7	14	ug/Kg	<MDL	
Di-N-Octyl Phthalate	8	16	ug/Kg	<MDL	
Benzo(b)fluoranthene	3	6	ug/Kg	<MDL	
Benzo(k)fluoranthene	3	6	ug/Kg	<MDL	
Benzo(a)pyrene	3	6	ug/Kg	<MDL	
Indeno(1,2,3-Cd)Pyrene	9	18	ug/Kg	<MDL	
Dibenzo(a,h)anthracene	7	14	ug/Kg	<MDL	
Benzo(g,h,i)perylene	8	16	ug/Kg	<MDL	
Aniline	19	38	ug/Kg	<MDL	

B

B

Run ID: R68341 Workgroup: WG55264 (BS#110-bnall)

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SB:WGS5264-2 MB:WGS5264-1 Matrix: OTHR SOLID Listtype: ORBNALL Method: EPA 3550B/8270C (7-3-01-004) Project: Pkey: SED																	
Parameter	Mdl	Rdl	Units	MB Value	Truevalue	SB Value	% Rec.	Qual	Limits	Truevalue	Value	% Rec.	Qual	Limits	RPD/RSD	Qual	Limits
Anthracene	4	8	ug/Kg	<MDL	66.6667	57.7	87		50-150					50-150			100
Di-N-Butyl Phthalate	5	10	ug/Kg	15.1	66.6667	70.6	83		50-150					50-150			100
Fluoranthene	8	16	ug/Kg	<MDL	66.6667	68.4	103		50-150					50-150			100
Pyrene	4	8	ug/Kg	<MDL	66.6667	62.5	94		50-150					50-150			100
Benzyl Butyl Phthalate	6	12	ug/Kg	<MDL	66.6667	65.1	98		50-150					50-150			100
Benzo(a)anthracene	2	4	ug/Kg	<MDL	66.6667	63.1	95		50-150					50-150			100
Chrysene	4	8	ug/Kg	<MDL	66.6667	58.9	88		50-150					50-150			100
Bis(2-Ethylhexyl)Phthalate	6.7	14	ug/Kg	14.5	66.6667	70.7	84		50-150					50-150			100
Di-N-Octyl Phthalate	8	16	ug/Kg	<MDL	66.6667	57.3	86		50-150					50-150			100
Benzo(b)fluoranthene	3	6	ug/Kg	<MDL	66.6667	70.6	106		50-150					50-150			100
Benzo(k)fluoranthene	3	6	ug/Kg	<MDL	66.6667	67.3	101		50-150					50-150			100
Benzo(a)pyrene	3	6	ug/Kg	<MDL	66.6667	49.8	75		50-150					50-150			100
Indeno(1,2,3-Cd)Pyrene	9	18	ug/Kg	<MDL	66.6667	55.8	84		50-150					50-150			100
Dibenzo(a,h)anthracene	7	14	ug/Kg	<MDL	66.6667	53.9	81		50-150					50-150			100
Benzo(g,h,i)perylene	8	16	ug/Kg	<MDL	66.6667	52.1	78		50-150					50-150			100
Aniline	19	38	ug/Kg	<MDL	66.6667	<MDL	0	*	50-150					50-150			100
Benzyl Alcohol	6	12	ug/Kg	<MDL	66.6667	12.4	19	*	50-150					50-150			100
2-Methylphenol	19	38	ug/Kg	<MDL	66.6667	<MDL	0	*	50-150					50-150			100
4-Methylphenol	16	32	ug/Kg	<MDL	66.6667	<MDL	0	*	50-150					50-150			100
Benzoic Acid	6	12	ug/Kg	<MDL	66.6667	27.3	41		50-150					50-150			100
2-Methylnaphthalene	14	28	ug/Kg	<MDL	66.6667	46.1	69		50-150					50-150			100
2,4,5-Trichlorophenol	12	24	ug/Kg	<MDL	66.6667	38.2	57		50-150					50-150			100
Dibenzofuran	14	28	ug/Kg	<MDL	66.6667	45.6	68		50-150					50-150			100
Carbazole	7	14	ug/Kg	<MDL	66.6667	71.5	107		50-150					50-150			100
Coprostanol	14	28	ug/Kg	<MDL	666.6667	455	68		50-150					50-150			100
Caffeine	6	12	ug/Kg	<MDL	66.6667	94.2	141		50-150					50-150			100
MS:WGS5264-3 MSD:WGS5264-4 L20703-5 Matrix: SALTWATER Listtype: ORBNALL Method: EPA 3550B/8270C (7-3-01-004) Project: 423050-160 Pkey: SED																	
Parameter	Mdl	Rdl	Units	Sample Value	Truevalue	MS Value	% Rec.	Qual	Limits	Truevalue	MSD Value	% Rec.	Qual	Limits	RPD/RSD	Qual	Limits
N-Nitrosodimethylamine	20	40	ug/Kg	<MDL	66.6667	32	48	G	50-150	66.6667	36	54	*	50-150			100
Phenol	9	18	ug/Kg	<MDL	66.6667	27.2	41	G	50-150	66.6667	25.4	38	*	50-150	8		100
Bis(2-Chloroethyl)Ether	15	30	ug/Kg	<MDL	66.6667	26	40	G	50-150	66.6667	26	39	*	50-150			100
2-Chlorophenol	8	16	ug/Kg	<MDL	66.6667	28.3	43	G	50-150	66.6667	27.4	41	*	50-150	5		100
1,3-Dichlorobenzene	26	53	ug/Kg	<MDL	66.6667	23.6	35	G	50-150	66.6667	25.5	38	*	50-150	8		100
1,4-Dichlorobenzene	13	26	ug/Kg	<MDL	66.6667	23	35	G	50-150	66.6667	25.7	39	*	50-150	11		100
1,2-Dichlorobenzene	26	53	ug/Kg	<MDL	66.6667	24.3	36	G	50-150	66.6667	25.8	39	*	50-150	8		100
Bis(2-Chloroisopropyl)Ether	15	30	ug/Kg	<MDL	66.6667	40.1	60		50-150	66.6667	36.2	54	*	50-150	11		100
N-Nitrosodi-N-Propylamine	9	18	ug/Kg	<MDL	66.6667	50.1	75		50-150	66.6667	52.7	79	*	50-150	5		100
Hexachloroethane	15	30	ug/Kg	<MDL	66.6667	28	41	G	50-150	66.6667	29	44	*	50-150	2		100
Nitrobenzene	16	32	ug/Kg	<MDL	66.6667	41.4	62		50-150	66.6667	40.4	61	*	50-150	2		100
Isophorone	19	38	ug/Kg	<MDL	66.6667	66.4	100		50-150	66.6667	60.5	91	*	50-150	9		100
2-Nitrophenol	15	30	ug/Kg	<MDL	66.6667	34.2	51		50-150	66.6667	33.6	50	*	50-150	2		100
2,4-Dimethylphenol	7	14	ug/Kg	<MDL	66.6667	39.8	60		50-150	66.6667	27.4	41	*	50-150	38		100
Bis(2-Chloroethoxy)Methane	17	34	ug/Kg	<MDL	66.6667	35.2	53		50-150	66.6667	32	48	*	50-150	10		100
2,4-Dichlorophenol	16	32	ug/Kg	<MDL	66.6667	49.4	74		50-150	66.6667	43.5	65	*	50-150	13		100
1,2,4-Trichlorobenzene	26	53	ug/Kg	<MDL	66.6667	29.7	44	G	50-150	66.6667	27.2	41	*	50-150	7		100
Naphthalene	14	28	ug/Kg	<MDL	66.6667	32.3	48	G	50-150	66.6667	28.9	43	*	50-150	11		100
Hexachlorobutadiene	75	1.5	ug/Kg	<MDL	66.6667	29.9	45	G	50-150	66.6667	28.1	42	*	50-150	7		100

MS:WG55264-3 MSD:WG55264-4 L20703-5 Matrix: SALTWTRSED Listtype: ORBNALL Method: EPA 35508/8270C (7-3-01-004) Project: 423056-160 PKey: SED																	
Parameter	Mdl	Rdl	Units	Sample	True Value	MS Value	% Rec.	Qual	Limits	True Value	MSD Value	% Rec.	Qual	Limits	RPD/RSD	Qual	Limits
2,4,6-Trichlorophenol	13	26	ug/kg	<MDL	66.6667	56.1	84		50-150	66.6667	50.3	75		50-150	11		100
2-Chloronaphthalene	16	32	ug/kg	<MDL	66.6667	38.4	58		50-150	66.6667	33.1	50		50-150	15		100
Acenaphthylene	15	30	ug/kg	<MDL	66.6667	69.4	104		50-150	66.6667	59.7	90		50-150	14		100
Dimethyl Phthalate	11	22	ug/kg	<MDL	66.6667	50.7	76		50-150	66.6667	44.2	66		50-150	14		100
2,6-Dinitrotoluene	10	20	ug/kg	<MDL	66.6667	62.5	94		50-150	66.6667	57.4	86		50-150	9		100
Acenaphthene	7	14	ug/kg	<MDL	66.6667	46.6	70		50-150	66.6667	40.4	61		50-150	14		100
2,4-Dinitrotoluene	3	6	ug/kg	<MDL	66.6667	65	97		50-150	66.6667	57.2	86		50-150	12		100
Fluorene	13	26	ug/kg	<MDL	66.6667	60.1	90		50-150	66.6667	50.3	75		50-150	18		100
Diethyl Phthalate	6	12	ug/kg	<MDL	66.6667	60.6	91		50-150	66.6667	51.6	77		50-150	17		100
4-Chlorophenyl Phenyl Ether	13	26	ug/kg	<MDL	66.6667	52.8	79		50-150	66.6667	43.8	66		50-150	18		100
N-Nitrosodiphenylamine	20	40	ug/kg	<MDL	66.6667	49	74		50-150	66.6667	43.8	66		50-150	11		100
1,2-Diphenylhydrazine	10	20	ug/kg	<MDL	66.6667	92.5	139		50-150	66.6667	81.6	122		50-150	13		100
4-Bromophenyl Phenyl Ether	9	18	ug/kg	<MDL	66.6667	59.9	90		50-150	66.6667	55	82		50-150	9		100
Hexachlorobenzene	.66	1.33	ug/kg	<MDL	66.6667	54.2	81		50-150	66.6667	47.9	72		50-150	12		100
Pentachlorophenol	5	10	ug/kg	<MDL	66.6667	61.3	92		50-150	66.6667	49.6	74		50-150	22		100
Phenanthrene	4	8	ug/kg	6.3	66.6667	74.7	103		50-150	66.6667	58.4	88		50-150	28		100
Anthracene	4	8	ug/kg	<MDL	66.6667	87.8	132		50-150	66.6667	73.6	110		50-150	18		100
Di-N-Butyl Phthalate	5	10	ug/kg	23.6	66.6667	90.4	100		50-150	66.6667	78.8	83		50-150	19		100
Fluoranthene	8	16	ug/kg	18.3	66.6667	128	165		50-150	66.6667	90.2	108		50-150	42		100
Pyrene	4	8	ug/kg	4.4	66.6667	102	146		50-150	66.6667	73.9	104		50-150	34		100
Benzyl Butyl Phthalate	6	12	ug/kg	<MDL	66.6667	83.9	126		50-150	66.6667	72.1	108		50-150	15		100
Benzo(a)anthracene	2	4	ug/kg	6.08	66.6667	86.9	121		50-150	66.6667	69.3	95		50-150	24		100
Chrysene	4	8	ug/kg	5.9	66.6667	80	111		50-150	66.6667	61.5	83		50-150	29		100
Bis(2-Ethylhexyl)Phthalate	6.7	14	ug/kg	38.1	66.6667	146	161		50-150	66.6667	132	141		50-150	13		100
Di-N-Octyl Phthalate	8	16	ug/kg	<MDL	66.6667	87.1	131		50-150	66.6667	74.2	111		50-150	17		100
Benzo(b)fluoranthene	3	6	ug/kg	7.92	66.6667	104	144		50-150	66.6667	79.4	107		50-150	29		100
Benzo(k)fluoranthene	3	6	ug/kg	4.3	66.6667	87.1	124		50-150	66.6667	69.9	98		50-150	23		100
Benzo(a)pyrene	3	6	ug/kg	<MDL	66.6667	97.8	147		50-150	66.6667	74.7	112		50-150	27		100
Indeno(1,2,3-Cd)Pyrene	9	18	ug/kg	<MDL	66.6667	59.7	90		50-150	66.6667	49.5	74		50-150	20		100
Dibenzo(a,h)anthracene	7	14	ug/kg	<MDL	66.6667	50.8	76		50-150	66.6667	43	64		50-150	17		100
Benzo(g,h,i)perylene	8	16	ug/kg	<MDL	66.6667	52.4	79		50-150	66.6667	43.1	65		50-150	19		100
Aniline	19	38	ug/kg	<MDL	66.6667	<MDL	0		50-150	66.6667	<MDL			50-150	11		100
Benzyl Alcohol	6	12	ug/kg	<MDL	66.6667	33.8	51		50-150	66.6667	37.8	57		50-150	11		100
2-Methylphenol	19	38	ug/kg	<MDL	66.6667	34	51		50-150	66.6667	30	45		50-150	13		100
4-Methylphenol	16	32	ug/kg	<MDL	66.6667	39.1	59		50-150	66.6667	34.5	52		50-150	10		100
Benzoic Acid	6	12	ug/kg	60.4	66.6667	104	65		50-150	66.6667	108	72		50-150	19		100
2-Methylnaphthalene	14	28	ug/kg	<MDL	66.6667	42.5	64		50-150	66.6667	35.1	53		50-150	12		100
2,4,5-Trichlorophenol	12	24	ug/kg	<MDL	66.6667	60.8	91		50-150	66.6667	54.1	81		50-150	16		100
Dibenzofuran	14	28	ug/kg	<MDL	66.6667	53.6	80		50-150	66.6667	45.3	68		50-150	19		100
Carbazole	7	14	ug/kg	<MDL	66.6667	78.5	118		50-150	66.6667	65.3	98		50-150	2		100
Coprostanol	14	28	ug/kg	<MDL	666.6667	576	86		50-150	666.6667	561	84		50-150	2		100
Caffeine	6	12	ug/kg	<MDL	66.6667	103	155		50-150	66.6667	89.6	134		50-150	15		100
LD:WG55264-5 L20703-6 Matrix: SALTWTRSED Listtype: ORBNALL Method: EPA 35508/8270C (7-3-01-004) Project: 423056-160 PKey: SED																	
Parameter	Mdl	Rdl	Units	Sample	True Value	LD Value	% Rec.	Qual	Limits	RPD/RSD	Qual	Limits					
N-Nitrosodimethylamine	20	40	ug/kg	<MDL	<MDL	<MDL						100					
Phenol	9	18	ug/kg	<MDL	<MDL	<MDL						100					
Bis(2-Chloroethyl)Ether	15	30	ug/kg	<MDL	<MDL	<MDL						100					

LD:WQ5264-5 L20703-6 Matrix: SALTWTRSED Listtype: ORBNALL Method: EPA 35508/8270C (7-3-01-004) Project: 423056-160 Pkey: SED												
Parameter	Mdl	Rdl	Units	SampValue	TrueValue	LD Value	% Rec.	Qual	Limits	RPD/RSD	Qual	Limits
N-Nitrosodimethylamine	20	40	ug/Kg	<MDL	<MDL	<MDL						100
Phenol	9	18	ug/Kg	<MDL	<MDL	<MDL						100
Bis(2-Chloroethyl)Ether	15	30	ug/Kg	<MDL	<MDL	<MDL						100

LD:W655264-5 L20703-6 Matrix: SALTWATERSED L1sttype: CRBNALL Method: EPA 3350B/8270C (7-3-01-004) Project: 423056-163 PKey: SED

Parameter	Mdl	Rdl	Units	Sample	Truevalue	LD Value	% Rec.	Qual	Limits	RPD/RSD	Qual	Limits
2-Chlorophenol	8	16	ug/Kg	<MDL	<MDL	<MDL						100
1,3-Dichlorobenzene	.26	.53	ug/Kg	<MDL	<MDL	<MDL						100
1,4-Dichlorobenzene	.13	.264	ug/Kg	<MDL	<MDL	<MDL						100
1,2-Dichlorobenzene	.26	.53	ug/Kg	<MDL	<MDL	<MDL						100
Bis(2-Chloroisopropyl)Ether	15	30	ug/Kg	<MDL	<MDL	<MDL						100
N-Nitrosodi-N-Propylamine	9	18	ug/Kg	<MDL	<MDL	<MDL						100
Hexachloroethane	15	30	ug/Kg	<MDL	<MDL	<MDL						100
Nitrobenzene	16	32	ug/Kg	<MDL	<MDL	<MDL						100
Isophorone	19	38	ug/Kg	<MDL	<MDL	<MDL						100
2-Nitrophenol	15	30	ug/Kg	<MDL	<MDL	<MDL						100
2,4-Dimethylphenol	7	14	ug/Kg	<MDL	<MDL	<MDL						100
Bis(2-Chloroethoxy)Methane	17	34	ug/Kg	<MDL	<MDL	<MDL						100
2,4-Dichlorophenol	16	32	ug/Kg	<MDL	<MDL	<MDL						100
1,2,4-Trichlorobenzene	.26	.53	ug/Kg	<MDL	<MDL	<MDL						100
Naphthalene	14	28	ug/Kg	<MDL	<MDL	<MDL						100
Hexachlorobutadiene	.75	1.5	ug/Kg	<MDL	<MDL	<MDL						100
2,4,6-Trichlorophenol	13	26	ug/Kg	<MDL	<MDL	<MDL						100
2-Chloronaphthalene	16	32	ug/Kg	<MDL	<MDL	<MDL						100
Acenaphthylene	15	30	ug/Kg	<MDL	<MDL	<MDL						100
Dimethyl Phthalate	11	22	ug/Kg	<MDL	<MDL	<MDL						100
2,6-Dinitrotoluene	10	20	ug/Kg	<MDL	<MDL	<MDL						100
Acenaphthene	7	14	ug/Kg	<MDL	<MDL	<MDL						100
2,4-Dinitrotoluene	3	6	ug/Kg	<MDL	<MDL	<MDL						100
Fluorene	13	26	ug/Kg	<MDL	<MDL	<MDL						100
Diethyl Phthalate	6	12	ug/Kg	<MDL	<MDL	<MDL						100
4-Chlorophenyl Phenyl Ether	13	26	ug/Kg	<MDL	<MDL	<MDL						100
N-Nitrosodiphenylamine	20	40	ug/Kg	<MDL	<MDL	<MDL						100
1,2-Diphenylhydrazine	10	20	ug/Kg	<MDL	<MDL	<MDL						100
4-Bromophenyl Phenyl Ether	9	18	ug/Kg	<MDL	<MDL	<MDL						100
Hexachlorobenzene	.66	1.33	ug/Kg	<MDL	<MDL	<MDL						100
Pentachlorophenol	5	10	ug/Kg	<MDL	<MDL	<MDL						100
Phenanthrene	4	8	ug/Kg	<MDL	<MDL	<MDL						100
Anthracene	4	8	ug/Kg	<MDL	<MDL	<MDL						100
Di-N-Butyl Phthalate	5	10	ug/Kg	<MDL	<MDL	<MDL						100
Fluoranthene	8	16	ug/Kg	<MDL	<MDL	<MDL						100
Pyrene	4	8	ug/Kg	<MDL	<MDL	<MDL						100
Benzyl Butyl Phthalate	6	12	ug/Kg	<MDL	<MDL	<MDL						100
Benzo(a)anthracene	2	4	ug/Kg	<MDL	<MDL	<MDL						100
Chrysene	4	8	ug/Kg	<MDL	<MDL	<MDL						100
Bis(2-Ethylhexyl)Phthalate	6.7	14	ug/Kg	<MDL	<MDL	<MDL						100
Di-N-Octyl Phthalate	8	16	ug/Kg	<MDL	<MDL	<MDL						100
Benzo(b)fluoranthene	3	6	ug/Kg	<MDL	<MDL	<MDL						100
Benzo(k)fluoranthene	3	6	ug/Kg	<MDL	<MDL	<MDL						100
Benzo(a)pyrene	3	6	ug/Kg	<MDL	<MDL	<MDL						100
Indeno(1,2,3-Cd)Pyrene	9	18	ug/Kg	<MDL	<MDL	<MDL						100
Dibenzo(a,h)anthracene	7	14	ug/Kg	<MDL	<MDL	<MDL						100
Benzo(g,h,i)perylene	8	16	ug/Kg	<MDL	<MDL	<MDL						100
Aniline	19	38	ug/Kg	<MDL	<MDL	<MDL						100
Benzyl Alcohol	6	12	ug/Kg	<MDL	<MDL	<MDL						100
2-Methylphenol	19	38	ug/Kg	<MDL	<MDL	<MDL						100
4-Methylphenol	16	32	ug/Kg	<MDL	<MDL	<MDL						100

LD:W655264-5 L20703-6 Matrix: SALTWTRSED Listtype: ORBNALL Method: EPA 3550B/8270C (7-3-01-004) Project: 423056-160 PKey: SED

Parameter	Mdl	Rdl	Units	Sample Value	True Value	LD Value	% Rec. Qual	Limits	RPD/RSD	Qual	Limits
Benzoic Acid	6	12	ug/Kg	50.1	46.4				8		100
2-Methylnaphthalene	14	28	ug/Kg	<MDL	<MDL						100
2,4,5-Trichlorophenol	12	24	ug/Kg	<MDL	<MDL						100
Dibenzofuran	14	28	ug/Kg	<MDL	<MDL						100
Carbazole	7	14	ug/Kg	<MDL	<MDL						100
Coprostanol	14	28	ug/Kg	<MDL	<MDL						100
Caffeine	6	12	ug/Kg	<MDL	<MDL						100

SRM:W655264-6 Matrix: OTHR SOLID Listtype: ORBNALL Method: EPA 3550B/8270C (7-3-01-004) Project: PKey: SED

Parameter	Mdl	Rdl	Units	Sample Value	True Value	SRM Value	% Rec. Qual	Limits	RPD/RSD	Qual	Limits
Naphthalene	53	2800	ug/Kg	1629.3333	220		13	80-120			100
Phenanthrene	400	800	ug/Kg	5200	4340		84	80-120			100
Anthracene	400	800	ug/Kg	1746.6667	1450		83	80-120			100
Fluoranthene	800	1600	ug/Kg	8802.6667	9780		111	80-120			100
Pyrene	400	800	ug/Kg	9573.3333	8540		89	80-120			100
Benzo(a)anthracene	200	400	ug/Kg	4658.6667	4620		99	80-120			100
Chrysene	400	800	ug/Kg	4797.3333	5240		109	80-120			100
Benzo(b)fluoranthene	300	600	ug/Kg	5882.6667	5890		100	80-120			100
Benzo(k)fluoranthene	300	600	ug/Kg	2269.3333	2260		99	80-120			100
Benzo(a)pyrene	300	600	ug/Kg	4242.6667	4620		109	80-120			100
Indeno(1,2,3-cd)Pyrene	900	1800	ug/Kg	2744	2230		81	80-120			100
Dibenzo(a,h)anthracene	53	1400	ug/Kg	418.6667	460		110	80-120			100
Benzo(g,h,i)perylene	800	1600	ug/Kg	2802.6667	1850		66	80-120			100

Sample #	2-Fluorophenol	d5-Phenol	d5-Nitrobenzene	d4-2-Chlorophenol	d4-1,2-Dichlorobenzene	2-Fluorobiphenyl	2,4,6-Tribromophenol	d14-Terphenyl
L20703-1	43	50	51	55	39	68	81	85
L20703-2	28 G	avg=57.25	avg=60.75	36 G	32	52	79 G	82
L20703-3	31 G	avg=43.5	avg=50.5	42 G	33	59	85 G	83
L20703-4	29	avg=49.25	avg=54.25	43 G	36	65	96	87
L20703-5	26 G	avg=52.75	avg=57.5	43 G	21	57	75 G	94
L20703-6	26 G	avg=44.5	avg=54.5	26 G	0 G	47 G	35 G	97 G
L20703-7	28 G	avg=28	avg=44.5	33 G	0 G	63 G	35 G	85 G
L20703-8	34 G	avg=33.25	avg=46.5	30 G	0 G	64 G	31 G	86 G
W655264-1	36 G	avg=32.5	avg=47.5	45 G	64	62	24 G	103
W655264-2	29 G	avg=41.5	avg=73	47 G	74	81	54 G	126
W655264-3	35	avg=53	avg=91	46	48	73	94	122
W655264-4	29 G	avg=47.25	avg=76	43 G	49	58	82 G	101
W655264-5	33	avg=52.25	avg=69	48	48	74	94	93
W655264-6	47	avg=61	avg=70.25	68	51		60	88

METRO Environmental Laboratory

WORK GROUP REPORT (wk02)

May 10 2001, 11:12 am

Work Group: WG55245 (PPS#234-pcb) for Department: 7 - Organics, Trace

Created: 09-MAY-01 Due: Operator: lm/mm

Sample	Project Number	Project Description	PKey	C	Product	Matrix	Stat	UA	Workdate	Due date
L20703-1	423056-160	Norfolk Cleanup Study	SED	S	PCB	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-2	423056-160	Norfolk Cleanup Study	SED	S	PCB	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-3	423056-160	Norfolk Cleanup Study	SED	S	PCB	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-4	423056-160	Norfolk Cleanup Study	SED	S	PCB	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-5	423056-160	Norfolk Cleanup Study	SED	S	PCB	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-6	423056-160	Norfolk Cleanup Study	SED	S	PCB	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-7	423056-160	Norfolk Cleanup Study	SED	S	PCB	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
L20703-8	423056-160	Norfolk Cleanup Study	SED	S	PCB	SALTWTRSED	PREP	U	08-MAY-01	08-JUN-01
WG55245-1	MB					S PCB				
WG55245-2	SB					S PCB				
WG55245-3	MS		SED	S	PCB	OTHER SOLID	PREP	U	09-MAY-01	
WG55245-4	MSD		SED	S	PCB	SALTWTRSED	PREP	U	09-MAY-01	
WG55245-5	SRM					S PCB				
WG55245-6	LD		SED	S	PCB	OTHER SOLID	PREP	U	09-MAY-01	

Comments:

L20703-1 3-Grab Composite, 0 - 2 cm
 L20703-2 3-Grab Composite, 0 - 10 cm
 L20703-3 3-Grab Composite, 0 - 2 cm
 L20703-4 3-Grab Composite, 0 - 10 cm
 L20703-5 3-Grab Composite, 0 - 2 cm
 L20703-6 3-Grab Composite, 0 - 10 cm
 L20703-7 3-Grab Composite, 0 - 2 cm
 L20703-8 3-Grab Composite, 0 - 10 cm
 WG55245-1 MB050901
 WG55245-2 WG55245-1
 WG55245-3 L20703-2
 WG55245-4 WG55245-3 L20703-2
 WG55245-5 HS2
 WG55245-6 L20703-1

WB:W655245-1 Matrix: OTHER SOLID Listtype: ORPCB Method: EPA 3550B/8082 (7-3-03-002) Project: PKey: SED

Parameter	Mdl	Rdl	Units	MB Value	Qual
Aroclor 1016	4.2	8.33	ug/Kg	<MDL	
Aroclor 1221	4.2	8.33	ug/Kg	<MDL	
Aroclor 1232	4.2	8.33	ug/Kg	<MDL	
Aroclor 1242	4.2	8.33	ug/Kg	<MDL	
Aroclor 1248	4.2	8.33	ug/Kg	<MDL	
Aroclor 1254	4.2	8.33	ug/Kg	<MDL	
Aroclor 1260	4.2	8.33	ug/Kg	<MDL	

SB:W655245-2 Matrix: OTHER SOLID Listtype: ORPCB Method: EPA 3550B/8082 (7-3-03-002) Project: PKey: SED

Parameter	Mdl	Rdl	Units	MB Value	True Value	% Rec. Qual	Limits	True Value	% Rec. Qual	Limits	RPD/RSD	Qual	Limits
Aroclor 1016	4.2	8.33	ug/Kg	<MDL	25	84	50-150	21	137	50-150			
Aroclor 1260	4.2	8.33	ug/Kg	<MDL	25	91	50-150	22.8	136	50-150			

WS:W655245-3 MSD:W655245-4 L20703-2 Matrix: SALTWTRSED Listtype: ORPCB Method: EPA 3550B/8082 (7-3-03-002) Project: 423056-160 PKey: SED

Parameter	Mdl	Rdl	Units	Sample Value	True Value	% Rec. Qual	Limits	True Value	% Rec. Qual	Limits	RPD/RSD	Qual	Limits
Aroclor 1016	4.2	8.33	ug/Kg	<MDL	25	145	50-150	36.3	137	50-150	6		100
Aroclor 1221	4.2	8.33	ug/Kg	<MDL	<MDL	<MDL	50-150	<MDL	<MDL	50-150			100
Aroclor 1232	4.2	8.33	ug/Kg	<MDL	<MDL	<MDL	50-150	<MDL	<MDL	50-150			100
Aroclor 1242	4.2	8.33	ug/Kg	<MDL	<MDL	<MDL	50-150	<MDL	<MDL	50-150			100
Aroclor 1248	4.2	8.33	ug/Kg	11	37.3	145	50-150	34.9	136	50-150			100
Aroclor 1254	4.2	8.33	ug/Kg	12.2	19.5	145	50-150	18	136	50-150			100
Aroclor 1260	4.2	8.33	ug/Kg	<MDL	25	145	50-150	33.9	136	50-150	6		100

SRN:W655245-5 Matrix: OTHER SOLID Listtype: ORPCB Method: EPA 3550B/8082 (7-3-03-002) Project: PKey: SED

Parameter	Mdl	Rdl	Units	Sample Value	True Value	% Rec. Qual	Limits	True Value	% Rec. Qual	Limits	RPD/RSD	Qual	Limits
Aroclor 1254	10	20	ug/Kg	111.4	111	100	80-120						

LD:W655245-6 L20703-1 Matrix: SALTWTRSED Listtype: ORPCB Method: EPA 3550B/8082 (7-3-03-002) Project: 423056-160 PKey: SED

Parameter	Mdl	Rdl	Units	Sample Value	True Value	% Rec. Qual	Limits	True Value	% Rec. Qual	Limits	RPD/RSD	Qual	Limits
Aroclor 1016	4.2	8.33	ug/Kg	<MDL	<MDL	<MDL		<MDL	<MDL				100
Aroclor 1221	4.2	8.33	ug/Kg	<MDL	<MDL	<MDL		<MDL	<MDL				100
Aroclor 1232	4.2	8.33	ug/Kg	<MDL	<MDL	<MDL		<MDL	<MDL				100
Aroclor 1242	4.2	8.33	ug/Kg	<MDL	<MDL	<MDL		<MDL	<MDL				100
Aroclor 1248	4.2	8.33	ug/Kg	20.8	20.2	100		20.2	100		3		100
Aroclor 1254	4.2	8.33	ug/Kg	20.9	21.4	100		21.4	100		2		100
Aroclor 1260	4.2	8.33	ug/Kg	<MDL	<MDL	<MDL		<MDL	<MDL				100

Sample #	2,4,5,6-Tetrachloro- m-xylene		Decachlorobiphenyl	
	50-150	102	50-150	105
L20703-1	96	102		99
L20703-2	119	96		122
L20703-3		119		88
L20703-4		86		101
L20703-5		85		112
L20703-6		86		107
L20703-7		105		100
L20703-8		96		104
W655245-1		91		106
W655245-2		85		148
W655245-3		139		134
W655245-4		129		148
W655245-5		133		97
W655245-6		92		